

\$ 1653

PATENT

Attorney Docket No.: A-70365-1/RFT/RMS/RMK
DW File No. 468488-153

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: \

PIERCE et al.

Serial No. 09/866,511

Filed: May 24, 2001

For: *Methods and Compositions Utilizing
Hybrid Exact Rotamer Optimization
Algorithms For Protein Design*

Examiner: UNKNOWN

Group Art Unit: 1653

CERTIFICATE OF MAILING

I hereby certify that this correspondence, including listed enclosures, is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231:

Dated: January 24, 2003

Signed: Magorie Jost
Magorie Jost

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patent
Washington, D.C. 20231

Sir:

In satisfaction of the duty of disclosure under 37 C.F.R. § 1.56, and in accordance with the provisions of 37 C.F.R. §§ 1.97 and 1.98, Applicants wish to draw the attention of the U.S. Patent and Trademark Office to the references cited on the accompanying substitute for form PTO-1449. Copies of the references are enclosed.

Further, in accordance with the provisions of 37 C.F.R. §§ 1.97(c) and 1.97(e)(1), the undersigned certifies that the references listed on the enclosed form PTO-1449 were first cited in an International Search Report dated December 11, 2002, for a counterpart PCT application. As such, the filing of this Information Disclosure Statement is within three months of the date of that International Search Report and, therefore, need not be accompanied by the fee. A copy of the International Search Report for the counterpart PCT application is enclosed herewith.

Serial No. 09/866,511
Filed: May 24, 2001

References cited in the search report and not cited herein have been previously disclosed by Applicants in the instant application.

None of the foregoing references are believed to disclose the invention as claimed. Nothing herein shall constitute an admission concerning the contents of any of the cited references, nor shall the inclusion of a reference herein be considered an admission that the reference constitutes prior art against the invention claimed in the above-identified application. Submission of the present document shall not be construed as an admission that a search has been made or that better art does not exist.

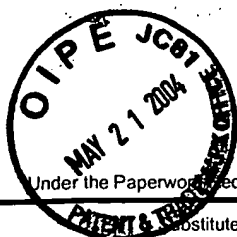
As far as is known to the undersigned, this Information Disclosure Statement is being filed before the mailing date of a first Office Action on the merits as set forth in 37 C.F.R. § 1.97(b), and therefore no fee is required. Although no fee is believed to be due, the Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-2319 (Our Order No. 468488-153 (A-70365-1/RFT/RMS/RMK)).

Respectfully submitted,
DORSEY & WHITNEY LLP

Dated: 1/23/03
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Renee M. Kossak, Reg. No. 47,717 for
Robin M. Silva, Reg. No. 38,304
Filed under 37 C.F.R. § 1.34(a)



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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet **1** of **1**

Complete if Known

Application Number	09/866,511
Filing Date	May 24, 2001
First Named Inventor	PIERCE, Niles
Group Art Unit	1653
Examiner Name	
Attorney Docket Number	A-70365-1/RFT/RMS/RMK (468488-153)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	U.S. Patent Document Number-Kind Code ² (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1				
	A2				
	A3				
	A4				
	A5				
	A6				
	A7				
	A8				
	A9				
	A10				
	A11				

FOREIGN PATENT DOCUMENTS

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	B1	WO 01/16862 A2	03-08-2001	California Institute of Technology		
	B2					
	B3					
	B4					
	B5					
	B6					

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ⁶
	C1	GORDON, DB and MAYO, SL, "Branch-and-Terminate: a combinatorial optimization algorithm for protein design," Structure 7(9):1089-1097 (1999)	
	C2	LEACH, AR and LEMON, AP, "Exploring the Conformational Space of Protein Side Chains Using Dead-End Elimination and the A* Algorithm," Proteins: Structure Function and Genetics 33:227-239 (1998)	
	C3	PIERCE, NA, et al., "Conformational Splitting: A More Powerful Criterion for Dead-End Elimination," J Comp. Chem. 21(11):999-1009 (2000)	
	C4	WERNISCH, L et al., "Automatic Protein Design with All Atom Force-fields by Exact and Heuristic Optimization," J. Mol. Biol. 301:713-736 (2000)	
	C5		

Examiner Signature	Date Considered
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¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English Language Translation is attached.

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PATENT
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Examiner: Unknown

Group Art Unit: 1653

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Dated: Nov. 7, 2002

Signed: Deborah Dyson

Deborah Dyson

INFORMATION DISCLOSURE STATEMENT

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Washington, DC 20231

Sir:

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As required by M.P.E.P. §2001.06(b), Applicant notes that the present application is related to the following patent applications:

<u>Application Serial No.</u>	<u>Date Filed</u>
09/058,459	April 10, 1998 (now U.S. Patent No. 6,188,965)
09/127,926	July 31, 1998 (now U.S. Patent No. 6,269,312)
09/714,357	November 15, 2000
09/812,034	March 19, 2001
09/827,960	April 4, 2001
09/837,886	April 18, 2001
10/057,552	January 25, 2002

None of the foregoing references are believed to disclose the invention as claimed. Nothing herein shall constitute an admission concerning the contents of any of the cited references, nor shall the inclusion of a reference herein be considered an admission that the reference constitutes prior art against the invention claimed in the above-identified application. Submission of the present document shall not be construed as an admission that a search has been made or that better art does not exist.

As far as is known to the undersigned, this Information Disclosure Statement is being filed within three months of the filing date of a national application, within three months of the date of entry of a national stage, or before the mailing date of a first Office Action on the merits as set forth in 37 C.F.R. § 1.97(b), and therefore no fee is required. While no fee is believed to be due, if this belief is in error, the Commissioner is authorized to charge any fees which may be required or credit any overpayment to Deposit Account No. 50-2319 (Our Order No. 468488-153 (A-70365-1/RFT/RMS/RMK)).

Serial No. 09/866,511)
Filed: May 24, 2001

Please direct any calls in connection with this application to the undersigned at (415)
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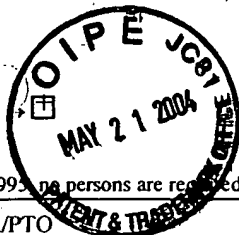
Respectfully submitted,
DORSEY & WHITNEY LLP

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Renee M. Kossak, Reg. No. 47,717 for
Robin M. Silva, Reg. No. 38,304
Filed under 37 C.F.R. § 1.34(a)

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				Application Number	09/866,511
				Filing Date	May 24, 2001
				First Named Inventor	Pierce
				Group Art Unit	1653
				Examiner Name	Unknown
Sheet	1	of	5	Attorney Docket Number	A-70365-1/RFT/RMS/RMK

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code ² (if known)			
	A1	4,939,666		Hardman, K.D.	07-1990	
	A2	5,241,470		Lee, C. and S. Subbiah	08-1993	
	A3	5,527,681		Holmes, C.P.	06-1996	
	A4	6,188,965		Mayo et al.	02-2001	
	A5	6,269,312		Mayo et al.	07-2001	
	A6	6,403,312		Dahiyat et al.	06-2002	

FOREIGN PATENT DOCUMENTS								
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		Office ³ Number ⁴	Kind Code ² (if known)					
	B1	WO	95/22625	A1		08-1995		
	B2	WO	98/32845	A1		07-1998		
	B3	WO	98/47089	A1		10-1998		
	B4	WO	00/23564	A2		04-2000		
	B5	WO	00/68396	A3		11-2000		
	B6	WO	01/59066	A3		08-2001		

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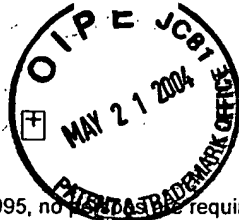
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¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English Language Translation is attached.

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Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				<i>Complete if Known</i>	
				Application Number	09/866,511
				Filing Date	May 24, 2001
				First Named Inventor	Pierce
				Group Art Unit	1653
				Examiner Name	Unknown
Sheet	2	of	5	Attorney Docket Number	A-70365-1/RFT/RMS/RMK

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS				
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	C1	Betz S.F., et al., "Controlling topology and native-like behavior of de novo-designed peptides: design and characterization of antiparallel four-stranded coiled coils," <i>Biochemistry</i> 1996 May 28;35(21):6955-62.		
	C2	Borman, "Proteins to Order", Chemical and Engineering Newsletter (C&EN) Oct. 6, 1997, 9-10 (1997).		
	C3	Bowie, J.U., et al., "Deciphering the Message in Protein Sequences: Tolerance to Amino Acid Substitutions", <i>Science</i> vol. 247:1306-1310 (March 1990)		
	C4	Bowie, J.U., et al., "A Method to Identify Protein Sequences that Fold into a Known Three-Dimensional Structure", <i>Science</i> Vol. 253:164-170 (July 1991)		
	C5	Brenner et al., "A Quantitative methodology for the de novo design of proteins", <i>Protein Sci.</i> 3:1871-1882 (Oct. 1994)		
	C6	Brooks et al., "CHARMM: A Program for Macromolecular Energy, Minimization, and Dynamics Calculations," <i>J. of Computational Chemistry</i> , 4(2):187-217 (1983).		
	C7	Connolly, M.L., "Solvent-Accessible Surfaces of Protein and Nucleic Acids", <i>Science</i> Vol. 221 (4612):709-713 (Aug 1983)		
	C8	Cornell et al., "A Second Generation Force Field for the Simulation of Proteins, Nucleic Acids, and Organic Molecules", <i>J. Am. Chem. Soc.</i> , 117:5179-5197 (1995)		
	C9	Dahiyat, B.I., et al., "Automated design of the surface positions of protein helices", <i>Protein Science</i> 6:1333-1337 (June 1997)		
	C10	Dahiyat, B.I., et al., "Protein design automation," <i>Caltech Biology Annual Report</i> , 172 (1995)		
	C11	Dahiyat, B.I., et al., "Protein Design Automation," Meeting Abstract; <i>Protein Science</i> vol. 4, Suppl. 2, 83 (1995)		
	C12	Dahiyat, B.I., et al., "Protein Design Automation," Poster Sessions, <i>Protein Science</i> vol.5, Suppl. 1, 2223 (1996)		
	C13	Dahiyat, B.I., et al., "De Novo Protein Design: Fully Automated Sequence Selection," <i>Science</i> , 278:82-87 (1997)		
	C14	Dahiyat, B.I., et al., "Probing the Role of Specificity in Protein Design," <i>Caltech Biology Annual Report</i> , 160-161 (1996)		
	C15	Dahiyat, B.I., et al., "Protein Design Automation," 1996, <i>Protein Science</i> vol. 5, pp.895-903, Nov. 30, 1999		
	C16	Dahiyat, B.I., et al., "First fully automatic design of a protein achieved by Caltech scientists", new press release (Oct. 1997)		
	C17	Dalal, S., et al., "Protein alchemy: Changing .beta.-sheet into .alpha.-helix", <i>Nature Struc. Biol.</i> Vol. 4(7): 548-552 (July 1997)		
	C18	DeGrado, W., "Proteins from Scratch," <i>Science</i> , 278:80-81 (1997)		

Examiner Signature		Date Considered	
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Application Number	09/866,511
Filing Date	May 24, 2001
First Named Inventor	Pierce
Group Art Unit	1653
Examiner Name	Unknown
Attorney Docket Number	A-70365-1/RFT/RMS/RMK

Sheet 3 of 5

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	C19	DeGrado et al. "Protein design, a minimalist approach" Science 1989 Feb 3;243(4891):622-8.	
	C20	Desjarlais, J.R., et al., "De novo design of the hydrophobic cores of proteins", Protein Science 4:2006-2018 (1995)	
	C21	Desjarlais, J.R., et al., "New strategies in protein design," Current Opinion in Biotechnology 460-466 (1995)	
	C22	Desmet, J., et al., "The Dead End Elimination' Theorem: A New Approach to the Side Chain Packing Protein", from "The Protein Folding Problem and Tertiary Structure Prediction" Ch.10: 1-49 (1994).	
	C23	Desmet, J., et al., "The dead-end elimination theorem and its use in protein side-chain positioning", Nature vol.356:539-542 (Apr. 1992)	
	C24	Desmet et al., "Theoretical and Algorithmical Optimization of the Dead-End Elimination Theorem," Proceedings of the Pacific Symposium on Biocomputing '97, 122-133 (1997)	
	C25	Dunbrack Jr., R.L., et al., "Conformational analysis of the backbone-dependent rotamer preferences of protein sidechains", Struc. Biol. Vol.1(5):334-340 (May 1994)	
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	C29	Gordon et al. "Energy functions for protein design," Curr Opinion in Struct. Biol., 9:509-513 (1999)	
	C30	Gordon et al., "Radical performance enhancements for combinatorial optimization algorithm based on the dead-end elimination theorem", Journal of Computational Chemistry, 19:1505-1514 (1998)	
	C31	Handel et al., "Metal ion-dependent modulation of the dynamics of a designed protein," Science 1993 Aug 13;261(5123):879-85.	
	C32	Harbury et al., "Repacking protein cores with backbone freedom: Structure prediction for coiled coils," Proc. Natl. Acad. Sci. USA, 92:8408-8412 (1995)	
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	C34	Hecht et al. "De novo design, expression, and characterization of Felix: a four-helix bundle protein of native-like sequence" Science 1990 Aug 24;249(4971):884-91.	
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	C36	Hellinga, H.W., et al., "Rational protein design: Combining theory and experiment", Proc. Natl. Acad. Sci, USA vol.94:10015-10017 (Sep. 1997)	
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	C38	Holmes, "First-ever designer protein fits like a glove," New Scientist, IPC Magazines Limited, Oct. 11, 1997	
	C39	Hurley et al., "Design and Structural Analysis of Alternative Hydrophobic Core Packing Arrangements in Bacteriophage T4 Lysozyme," J. Mol. Biol., 224:1143-1159(1992)	

Examiner Signature	Date Considered
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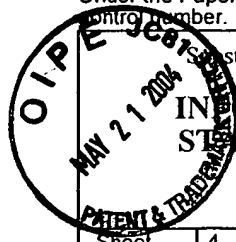
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Sheet 4 of 5

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	C40	Jones, D.T., "De novo protein design using pairwise potentials and a genetic algorithm", Protein Science 3:567-574 (1994)	
	C41	Kamtekar S., et al. "Protein design by binary patterning of polar and nonpolar amino acids" Science 1993 Dec 10;262(5140):1680-5.	
	C42	Klemba M., et al. "Novel metal-binding proteins by design," Nat Struct Biol. 1995 May;2(5):368-73.	
	C43	Koehl et al., "De Novo Protein Design, I. In Search of Stability and Specificity," J. Mol. Biol., 293:1161-1181 (1999)	
	C44	Kono et al., "Energy Minimization Method Using Automata Network for Sequence and Side-Chain Conformation Prediction from Given Backbone Geometry," Proteins: Structure, Function and Genetics, 19:224-255 (1994)	
	C45	Kortemme et al., "Design of a 20-Amino Acid, Three-Stranded β -Sheet Protein," Science, 281:253-256 (1988)	
	C46	Lam et al., "Application of combinatorial library methods in cancer research and drug discovery," Anti-Cancer Drug Design 12:145-167 (1997)	
	C47	Lasters et al., "Enhanced dead-end elimination in the search for the global minimum energy conformation of a collection of protein side chains," 1995, Protein Engineering, vol. 8, No. 8, pp. 815-822	
	C48	Lasters, I., et al., "Dead-End Based Modeling Tools to Explore the Sequence Space that is Compatible with a Given Scaffold", Jour. of Protein Chem. vol.16(5):449-452 (July 1997)	
	C49	Lazar et al., "De novo design of the hydrophobic core of ubiquitin," Protein Science 6:1167-1178 (1997)	
	C50	Lee et al., "Accurate prediction of the stability and activity effects of site-directed mutagenesis on a protein core," Nature, 352:448-451 (1991)	
	C51	Lim et al., "The crystal structure of a mutant protein with altered but improved hydrophobic core packaging," Proc Natl Acad Sci USA 1994 Jan 4;91(1):423-7	
	C52	Mayo et al., "DREIDING: A Generic Force Field for Molecular Simulations," J. Phys. Chem., 94:8897-8909 (1990)	
	C53	Minor, Jr. D.L., "Measurement of the .beta.-sheet-forming propensities of amino acids", Nature vol. 367:660-663 (Feb. 1994)	
	C54	Munoz, V., et al., "Helix design, prediction and stability", Curr. Opin. in Biotech. 6:382-386 (Aug. 1995)	
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	C57	Nautiyal S, et al., "A designed heterotrimeric coiled coil," Biochemistry 1995 Sep 19;34(37):11645-51.	
	C58	Pabo, C., "Designing proteins and peptides", Nature vol. 301:200 (Jan 1983)	
	C59	Padmanabhan, S., et al., "Relative helix-forming tendencies of nonpolar amino acids", Nature vol. 344:268-270 (March 1990)	

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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